

Multi-Spectral Infrared Focal Plane Array For Wildfire And Burning-Biomass Analysis, Phase I

Completed Technology Project (2018 - 2019)

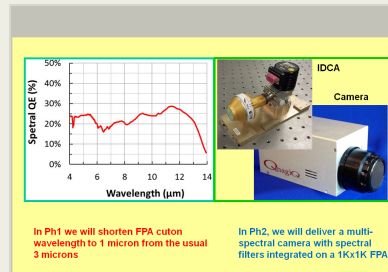


Project Introduction

An important NASA mission is to remotely analyze fires, such as wildfires and burning biomasses, for their chemical content. The chemical species of most interest have infrared spectral signatures at wavelengths ranging from 1.5 microns to 12 microns. A broadband infrared focal plane array (FPA) with that spectral coverage and high quantum efficiency is a key technology to enable this mission. QmagiQ has already developed high-performance FPAs with broadband response from 3-13 microns using strained layer superlattices (SLS). In Phase I, we will develop detector recipes to shorten the cuton wavelength from 3 microns to ~ 1 micron, and demonstrate it in actual FPAs. In Phase II, we will develop methods to integrate a set of spectral filters right on the FPA, covering the specific wavelengths of interest. The result will be a multi-spectral FPA with the smallest possible footprint, which will translate into a small light multi-spectral camera useful for a variety of NASA earth-observing and remote-sensing missions.

Anticipated Benefits

1. ASA's LANDSAT Data Continuity Mission - Thermal Infrared Sensor (LDCM-TIRS)
 2. NASA's HypsIRI Mission - Multispectral thermal infrared (TIR) imager
 3. Space- and ground-based astronomy and astrophysics
 4. Chemical/spectral mapping of fires, forests, vegetation, crops, and landmasses
 5. Temperature mapping of oceans and landmasses
 6. Atmospheric mapping
 7. Pollution monitoring
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1. Gas imaging (e.g. for the petrochemical and power utility industries)
 2. Security and surveillance
 3. Thermography
 4. Medical imaging
 5. Missile defense
 6. Space-based situational awareness



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Table of Contents

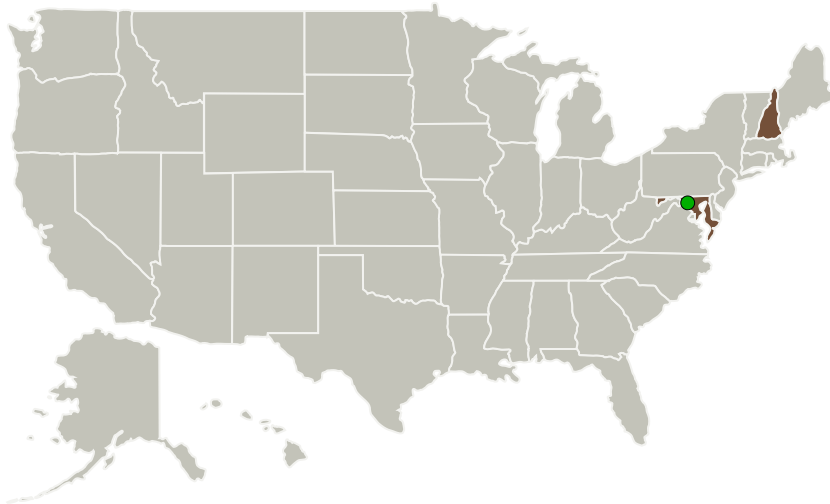
Project Introduction	1
Anticipated Benefits	1
Primary U.S. Work Locations and Key Partners	2
Project Transitions	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Images	3
Technology Areas	3
Target Destination	3

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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
QmagiQ, LLC	Lead Organization	Industry	Nashua, New Hampshire
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations

Maryland	New Hampshire
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Project Transitions

**July 2018:** Project Start**February 2019:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/141194>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

QmagiQ, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

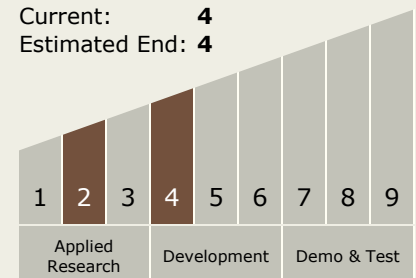
Carlos Torrez

Principal Investigator:

Mani Sundaram

Technology Maturity (TRL)

Start: 2
 Current: 4
 Estimated End: 4

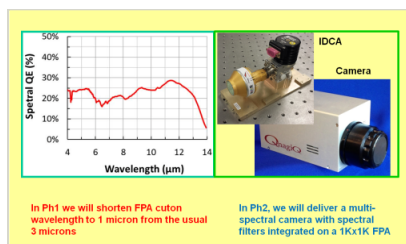


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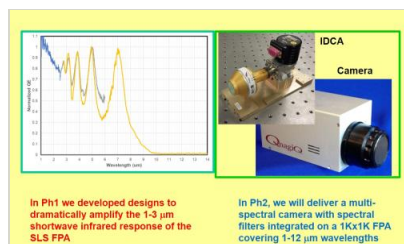


Images



Briefing Chart Image

Multi-Spectral Infrared Focal Plane Array For Wildfire And Burning-Biomass Analysis, Phase I
(<https://techport.nasa.gov/image/134888>)



Final Summary Chart Image

Multi-Spectral Infrared Focal Plane Array For Wildfire And Burning-Biomass Analysis, Phase I
(<https://techport.nasa.gov/image/130817>)

Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.1 Detectors and Focal Planes

Target Destination

Earth